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10/569,177	02/22/2006	David A. Fish	GB030146	1995
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CRAWLEY, KEITH L				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/569,177

**Applicant(s)**

FISH, DAVID A.

**Examiner**

KEITH CRAWLEY

**Art Unit**

2629

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 16-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-21, 23, 24, 26-30 and 32 is/are rejected.
- 7) ☒ Claim(s) 22, 25, and 31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7/13/07
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "I<sub>LED</sub>" and "V<sub>LED</sub>" (see fig. 4). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory

obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 17-22, 24-27, and 29-30 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 16-19 and 21-28, respectively, of copending Application No. 10/562276. Although the conflicting claims are not identical, they are not patentably distinct from each other

because it would have been obvious to one of ordinary skill in the art at the time the invention was made to exchange the terms "**row**", "**row conductor**", and "**current source circuit**" with "**column**", "**column power supply line**", and "**current sampling transistor**" respectfully.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim 16, of copending Application No. 10/562276, claims: "A display device comprising an active matrix array of current-addressed light emitting display elements arranged in rows and columns, comprising: compensation circuitry for modifying the target pixel drive currents to take account of the voltage on the respective **row conductor** at each pixel resulting from the currents drawn from the **row conductor** by the plurality of pixels and the dependency of the pixel brightness characteristics on the voltage on the row conductor at the pixel, the compensation circuitry comprising: means for applying an algorithm to the target pixel drive currents which represents the relationship between the currents drawn by the pixels in a **row** and the voltages on the **row conductor** at the locations of the pixels; and means for scaling the resulting values using a value representing the dependency of the pixel brightness characteristics on the voltage on the row conductor", which is not patentably distinct from claim 17 of the instant application.

Claim 17, of copending Application No. 10/562276, claims: "A device as claimed in claim 16, wherein the means for applying an algorithm derives values corresponding to the multiplication of a vector of the target pixel drive currents for a **row** of pixels by the inversion of the matrix M, in which:  $M = \begin{bmatrix} -2 & 1 & 1 & -2 & 1 & 1 & -2 & 1 & 1 & -2 \end{bmatrix}$ , and wherein the number of rows and columns of matrix M is equal to the number of pixels in the **row**.", which is not patentably distinct from claim 18 of the instant application.

Claim 18, of copending Application No. 10/562276, claims: "A device as claimed in claim 16, wherein each pixel comprises a **current source circuit** which converts an input voltage to a current using a drive transistor, and wherein the means for scaling uses a value including terms derived from: the current-voltage characteristics of the drive transistor; and the voltage-current characteristics of the light emitting display element", which is not patentably distinct from claim 19 of the instant application.

Claim 19, of copending Application No. 10/562276, claims: "A device as claimed in claim 18, wherein the drive transistor and the light emitting display element of each pixel are in series between the **row conductor** and a common line", which is not patentably distinct from claim 20 of the instant application.

Claim 21, of copending Application No. 10/562276, claims: "A device as claimed in claim 18, wherein the means for scaling uses a value further including a term derived

from the resistance (R) of the **row conductor**", which is not patentably distinct from claim 21 of the instant application.

Claim 22, of copending Application No. 10/562276, claims: "A device as claimed in claim 21, wherein the means for scaling (100) uses a value  $(1 - \alpha)R\lambda/(\lambda + \mu)$ , where: R is the resistance of the **row conductor** between adjacent pixels;  $\lambda$  is the slope of the current vs. voltage curve of the drive transistor;  $\mu$  is the slope of the current vs. voltage curve of the display element; and  $\alpha$  is the ratio of the current drawn by a pixel during a pixel programming phase to the current drawn by the pixel during display", which is not patentably distinct from claim 22 of the instant application.

Claim 23, of copending Application No. 10/562276, claims: "A device as claimed in claim 17, wherein the means for applying an algorithm derives values by a recursive operation  $F(n) = F(n-1) + j = 0 \text{ to } n-1$  times  $I(j) + F(0)$ , in which:  $F(n)$  is the nth term of a the vector result of multiplying the vector of the target pixel drive currents for a **row** of pixels by the inversion of the matrix M,  $F(0)$  being the first term; and  $I(j)$  is the target current for the jth pixel in a **row**, the first pixel being  $j=0$ ", which is not patentably distinct from claim 24 of the instant application.

Claim 24, of copending Application No. 10/562276, claims: "A device as claimed in claim 23, wherein:  $F(0) = 1/N + 1$  times  $j = 0 \text{ to } N-1$  times  $(N-j)$  times  $I$

.function. ( j ) ,in which: N is the total number pixels in the **row**", which is not patentably distinct from claim 25 of the instant application.

Claim 25, of copending Application No. 10/562276, claims: "A device as claimed in claim 16, wherein the means for scaling comprises a look up table", which is not patentably distinct from claim 26 of the instant application.

Claim 26, of copending Application No. 10/562276, claims: "A device as claimed in claim 25, further comprising at least one pixel compensation module, and further comprising means for updating the values of the look up table to enable changes in pixel brightness characteristics over time to be modeled based on analysis of the characteristics of the pixel compensation module", which is not patentably distinct from claim 27 of the instant application.

Claim 27, of copending Application No. 10/562276, claims: "Compensation circuitry for modifying target pixel drive currents for a display device which comprises an active matrix array of current-addressed light emitting display elements arranged in rows and columns having respective row and column conductors, the compensation circuitry comprising: means for applying an algorithm to the target pixel drive currents which represents the relationship between the currents drawn by the pixels in a **row** and the voltages on the **row conductor** at the locations of the pixels; and means for scaling the resulting values using a value representing the dependency of the pixel brightness

characteristics on the voltage on the **row conductor**, the scaling taking account of the voltage on the respective **row conductor** at each pixel resulting from the currents drawn from the **row conductor** by the plurality of pixels and the dependency of the pixel brightness characteristics on the voltage on the row conductor at the pixel.", which is not patentably distinct from claim 29 of the instant application.

Claim 28, of copending Application No. 10/562276, claims: "Compensation circuitry as claimed in claim 27, wherein the means for applying an algorithm derives values corresponding to the multiplication of a vector of the target pixel drive currents for a **row** of pixels by the inversion of the matrix **M**, in which:  $M = \begin{bmatrix} -2 & 1 & 1 & -2 & 1 & 1 & -2 & 1 & 1 & -2 \end{bmatrix}$ , and wherein the number of rows and columns of matrix **M** is equal to the number of pixels in the **row**", which is not patentably distinct from claim 30 of the instant application.

#### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 16-21, 23-24, 28-30 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 16 recites the limitations "the pixels" (in lines 3 and 4); "the voltage" (in line 8); "the pixel brightness characteristics" (in line 12); and "the row conductor" (in line 12).

There is insufficient antecedent basis for these limitations in the claim.

7. Claim 17 recites the limitations "the target pixel drive currents" (in line 3); "the pixels" (in lines 5 and 6); "the voltages" (in line 5); "the pixel brightness characteristics" (in line 7); "the voltage" (in line 7); and "the row conductor" (in line 7). There is

insufficient antecedent basis for these limitations in the claim.

8. Claim 18 recites the limitation "the target pixel drive currents" (in line 3). There is insufficient antecedent basis for this limitation in the claim.

9. Claim 19 recites the limitations "each pixel" (in line 2); and "the voltage-current characteristics" (in lines 6 and 8). There is insufficient antecedent basis for these limitations in the claim.

10. Claim 20 recites the limitation "each pixel" (in line 3). There is insufficient antecedent basis for this limitation in the claim.

11. Claim 21 recites the limitation "the resistance" (in line 3). There is insufficient antecedent basis for this limitation in the claim.

12. Claim 23 recites the limitation "the target pixel drive current" (in line 4). There is insufficient antecedent basis for this limitation in the claim.

13. Claim 24 recites the limitations "the target pixel drive currents" (in line 7); and "the target current" (in line 10). There is insufficient antecedent basis for these limitations in the claim.

14. Claim 28 recites the limitations "the pixels" (in lines 4 and 5); "the target pixel drive currents" (in line 9); "the voltage" (in lines 10 and 14); "the pixel brightness characteristics" (in line 14); and "the row conductor" (in line 14). There is insufficient antecedent basis for these limitations in the claim.

15. Claim 29 recites the limitations "the target pixel drive currents" (in line 3); "the voltages" (in line 5); "the pixels" (in line 6); "the pixel brightness characteristics" (in line 7); "the voltage" (in line 7); and "the row conductor" (in line 7). There is insufficient antecedent basis for these limitations in the claim.

16. Claim 30 recites the limitation "the target pixel drive currents" (in line 3). There is insufficient antecedent basis for this limitation in the claim.

17. Claim 32 recites the limitations "the target pixel drive currents" (in line 7); and "the target current" (in line 10). There is insufficient antecedent basis for these limitations in the claim.

Regarding claims 18 and 30, the ellipsis type punctuation marks "..." in the matrix (e.g., see line 5) renders the claim indefinite because the claim includes elements not actually disclosed (those encompassed by "..."), thereby rendering the scope of the claim unascertainable. See MPEP § 2173.

### ***Claim Rejections - 35 USC § 102***

18. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

19. Claims 16-17, 21, 26, and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Inoue et al. (US 7,071,635).

Regarding claim 16, Inoue discloses a display device comprising an array of light emitting display elements arranged in rows and columns (fig. 1, organic EL display 2, see fig. 8),

with a plurality of the pixels in a column being supplied with current from a respective column power supply line (fig. 8, drive line 4, see col. 2, line 63)

and the pixels being addressed row by row, the addressing of all rows defining a field period (col. 2, line 8-12, gate driver successively applies voltages to scanning electrodes, defining this as a field period is well known in the art),

the device further comprising: compensation circuitry for modifying target pixel drive currents to take account of the voltage on the column power supply line at each pixel resulting from the currents drawn from the column power supply line by the plurality of pixels in the column for each row addressing cycle in a field period (figs. 1 and 2, see col. 3, line 44-59)

and the dependency of the pixel brightness characteristics on the voltage on the row conductor at the pixel (col. 5, line 36-41 and col. 7, line 10-25, current supplied to EL element is controlled according to the voltage, voltage-current relationships are referenced in compensation scheme).

Regarding claim 17, Inoue discloses wherein the compensation circuitry comprises: means for applying an algorithm to the target pixel drive currents which represents the relationship between the currents drawn by the pixels in a column and the voltages on the column power supply line at the locations of the pixels (figs. 1 and 2, see col. 3, line 44-59)

and the dependency of the pixel brightness characteristics on the voltage on the row conductor (col. 5, line 36-41 and col. 7, line 10-25, current supplied to EL element is

controlled according to the voltage, voltage-current relationships are referenced in compensation scheme).

Regarding claim 21, Inoue discloses wherein the algorithm uses a value including a term derived from the resistance of the column power supply line (fig. 5, resistance  $R_0$  and  $R$  of drive line 4, see col. 5, line 42-51 and mathematical expressions 1 and 2).

Regarding claim 26, Inoue discloses wherein the means for applying an algorithm comprises a look up table (fig. 2, lookup table 31, see col. 7, line 10-18).

Regarding claim 28, this claim is rejected under the same rationale as claim 16.

Regarding claim 29, this claim is rejected under the same rationale as claim 17.

### ***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue in view of Kawashima et al. (US 6,091,203).

Regarding claim 19, Inoue discloses wherein the algorithm uses a value including terms derived from: the voltage-current characteristics of the drive transistor and the voltage-current characteristics of the light emitting display element (col. 5, line 36-41 and col. 7, line 10-25, current supplied to EL element is controlled according to the voltage, voltage-current relationships are referenced in compensation scheme);

Inoue fails to disclose wherein each pixel comprises a current sampling transistor which samples an input current and provides a drive voltage to a drive transistor.

Kawashima teaches wherein each pixel comprises a current sampling transistor which samples an input current and provides a drive voltage to a drive transistor (fig. 2, conversion TFT 18 samples current and provides drive voltage to drive TFT 15, see col. 8, line 10-27, see also fig. 6 and col. 10, line 26-30).

Inoue and Kawashima are both directed to methods and devices for driving active matrix displays. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method and device of Inoue with the method and device of Kawashima since such a modification provides an element driving device capable of controlling the operation of active elements at a desired state (Kawashima, col. 3, line 23-26) and provides a flat display device in which crosstalk is suppressed (Inoue, col. 2, line 41-43).

Regarding claim 20, Inoue discloses wherein the drive transistor and the light emitting display element of each pixel are in series between the column power supply

line and a common line (fig. 5, drive transistor TR2 and EL element 20 are in series between drive line 4 and counterelectrode).

22. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue in view of Cok (US 7,164,417).

Regarding claim 27, Inoue fails to disclose at least one pixel compensation module, and means for updating the values of the look up table to enable changes in pixel brightness characteristics over time to be modeled based on analysis of the characteristics of the pixel compensation module.

Cok teaches at least one pixel compensation module (fig. 1, light emitting element 17 and photosensor 15, see col. 2, line 54-60),

and means for updating the values of the look up table to enable changes in pixel brightness characteristics over time to be modeled based on analysis of the characteristics of the pixel compensation module (fig. 1, col. 2, line 37-53, see also col. 3, line 33-42 and col. 2, line 27-29).

Inoue and Cok are both directed to methods and devices for driving active matrix displays. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method and device of Inoue with the method and device of Cok since such a modification provides a simple design for accommodating optical feedback from active matrix display devices (Cok, col. 1, line 66-

67) and provides a flat display device in which crosstalk is suppressed (Inoue, col. 2, line 41-43).

***Allowable Subject Matter***

23. Claims 22, 25, and 31 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

24. Claims 18, 23, 24, 30, and 32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

25. Applicant's election with traverse of group II, claims 16-32, in the reply filed on 5/18/09 is acknowledged. The traversal is on the ground(s) that the claims of both groups have the same distinguishing features, so that any reasonable search of one group of claims will be sufficient for examining the other group of claims. This is not found persuasive because groups I and II are distinct and there would be a serious search and examination burden if restriction were not required because the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, and/or employing different search queries).

The requirement is still deemed proper and is therefore made FINAL.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH CRAWLEY whose telephone number is (571)270-7616. The examiner can normally be reached on M-F, 7:30-5:00 EST, alternate Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571)272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bipin Shalwala/  
Supervisory Patent Examiner, Art Unit 2629

/KEITH CRAWLEY/  
Examiner, Art Unit 2629

